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No. II.

MINERS' SAFE LAMP.

The SILVER VULCAN MEDAL and TEN GUINEAS were this session presented to Mr. J. ROBERTS, of St. Helen's, Lancashire, for his improved Safe Lamp for Miners; which has been placed in the Society's repository.

THE only real objection to the use of Sir H. Davy's safe lamp for coal miners, is the inferior degree of light that it gives when compared with that given by a naked candle. This arises from two causes, namely, the necessary obstruction offered by the black wire of which the cage or gauze is composed, within which the lamp is placed, and the casual obstruction occasioned by the adhesion of smoke to the inside of the cage when the lamp is not carefully trimmed, and of smut and dust to the outside of the cage.

To diminish the obscuration occasioned by the first cause, Mr. Roberts proposes that the wire shall be kept bright and polished, by cleaning the cage every night with a soft brush and the black powder or smut which occurs in all coal mines, especially in the neighbourhood of faults: this smut is pulverulent non-bituminous coal, sufficiently hard to remove the rust from the surface of the wire without materially wearing the wire itself.

As the lamp is at present constructed, the oil will run out of the cup or receptacle in which it is placed, if the lamp is laid in a horizontal position, an accident which frequently occurs on account of the lamp being rather top heavy. When this happens the gauze becomes smeared over with viscid oil, which causes the coal-dust floating in the air of the mine to adhere to it, and in a short time to fill up more or less the meshes of the gauze. By merely shaking or tapping the lamp the dust will not be dislodged; and if the miner attempts to clear his lamp by blowing through the wire gauze, he runs the risk of putting out the light, and after all very imperfectly clears the meshes; there is also perhaps some risk of forcing the flame through the meshes on the opposite side, and of producing an explosion, if the surrounding air is inflammable.

In Mr. Roberts's lamp the overflow of the oil is impossible, on account of the dome-shaped cover which surrounds the wick; the dust, therefore, that settles on the gauze, may be dislodged by a mere tap with the finger, or, what would perhaps be better, by the application of a small brush similar to that which soldiers carry to clear the pan of their muskets, and which might be attached by a bit of small chain to the handle of the lamp.

Reference to the Engraving.

Plate II. fig. 6 a section of the lamp *pp*, and wire gauze *q q*; *r r* a screwed cap, with a hollow dome *s*; it screws into the neck *t t* of the lamp: the dome rises a little above the wick-holder *u*, having an opening at top to let the wick

and trimming wire *v* rise through. This dome serves to catch and retain any oil that may spill by shaking the lamp or knocking it over, thereby protecting the wire gauze *q* from being smeared; *w* and *x* two locks, the former to secure the cap *g*, and the latter to secure the wire gauze *q* from being removed.

Fig. 7 a section of the cap and dome *r r s*, separate from the lamp: the wire gauze fits into the cavity *y y*, around the dome *s*; *z z* two of the four wires which serve to hold the wire gauze.